

CLAIMS

1. A method for identifying defects in a semiconductor or silicon structure comprising exposing said semiconductor or structure to at least one high intensity beam of light characterised by a spot size of between 0.1mm - 0.5 microns and a peak or average power of between  $10^4$  -  $10^9$  watts/cm<sup>2</sup>; and collecting luminescence from the semiconductor or structure so as to preserve defects in same.
2. A method according to Claim 1 comprising selecting the wavelength of said light so as to identify defects at a selective depth in said semiconductor or structure.
3. A method according to Claims 1 or 2 comprising exposing said semiconductor or silicon structure to a pulsed beam of light.
4. A method according to any preceding claim comprising collecting luminescence from a series of focal planes.
5. An apparatus for undertaking photoluminescence imaging of a semiconductor or silicon structure characterised in that it comprises at least one high intensity light generating means which produces a beam of light having a spot size between 0.1mm - 0.5 microns and a peak or average power of between  $10^4$  -  $10^9$  watts/cm<sup>2</sup>; a means for collecting luminescence from the semiconductor or silicon wafer and means for producing images of said semiconductor or structure so as to observe any defects that may be present.

*Replaced by Article 34*

6. An apparatus according to Claim 5 wherein said light generating means is provided with modulation means whereby the wavelength of said light beam can be selected.
7. Apparatus according to Claims 5 or 6 wherein said light generating means is provided with modulation means whereby the intensity of said light beam may be selected.
8. Apparatus according to Claims 5-7 wherein means is provided to enable a pulsed beam of light to be produced.
9. Apparatus according to Claims 5-8 wherein said light generating means is provided with modulation means whereby the frequency of said light beam may be selected.
10. Apparatus according to Claims 5-9 wherein said apparatus comprises confocal optics whereby images of said semiconductor or structure may be obtained through a series of focal planes.